Stoller
Grand Junction Office established 1959

299-E28-50 (C3659)
Log Data Report

Borehole Information:

Borehole: 299-E28-50 (C3659)			**Site:** 216-B-9 Crib		
Coordinates (WA State Plane)		**GWL (ft)[1]:** Not Reached		**GWL Date:** N/A[2]	
North	**East**	**Drill Date**	**TOC[3] Elevation**	**Total Depth (ft)**	**Type**
~136,841 m	~573,857 m	unknown	~207.4 m	12	unknown

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Steel Welded	1.9	8.625	8.0	0.3125	0	12

Borehole Notes:

The logging engineer measured the stickup using a steel tape. Calipers were used to measure the casing wall thickness and the outside diameter. The inside diameter is calculated. A reference point survey "X" is not located on top of the casing stickup. This borehole is not marked with any identification. On the basis of measurements using a steel tape, this borehole is located 31 ft south of borehole 299-E28-56 and 36.5 ft east of borehole 299-E28-62. The coordinates listed above are estimates based upon these measurements. Zero reference is the top of casing stickup. Top of casing stickup is cut squarely. On 03/12/02, the borehole was swabbed, and no contamination was detected.

Logging Equipment Information:

Logging System:	Gamma 2A		**Type:** SGLS (35%)
Calibration Date:	11/01/01	**Calibration Reference:**	GJO-2002-286-TAR
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	**1**	**2**			
Date	04/10/02	04/10/02			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	12.0	2.0			
Finish Depth (ft)	2.0	12.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N/A	N/A			
MSA Interval (ft)	0.5	0			
ft/min	N/A	N/A			
Pre-Verification	BA126CAB	BA126CAB			
Start File	BA127000	BA127021			

Log Run	1	2			
Finish File	BA127020	BA127041			
Post-Verification	BA128CAA	BA128CAA			
Depth Return Error (ft)	0	0			
Comments	No fine-gain adjustment.	Repeat section. No fine-gain adjustment.			

Logging Operation Notes:

Zero reference is the top of casing. Logging was performed with a centralizer installed on the sonde. Pre- and post-survey verification measurements for the SGLS employed the Amersham KUT verifier with serial number 082.

Analysis Notes:

Analyst:	Sobczyk	Date:	06/27/02	Reference:	

SGLS pre-run and post-run verification spectra were collected at the beginning and end of the day. The verification spectra were all within the control limits. The peak counts per second (cps) at the 609-keV, 1461-keV, and 2615-keV photopeaks on the post-run verification spectrum as compared to the pre-run verification spectrum were about 2 percent lower.

Log spectra for the SGLS were processed in batch mode using APTEC Supervisor to identify individual energy peaks and determine count rates. The post-run verification spectrum was used to determine the energy and resolution calibration for processing the data using APTEC Supervisor. Concentrations were calculated in Excel (source file: G2ANov1.xls), using parameters determined from analysis of recent calibration data. Zero reference is the top of the casing. The casing configuration was assumed to be one string of 8-in. casing with a thickness of 0.3125 in. to a log depth of 12.0 ft. This casing thickness was measured by the logging engineer. A water correction was not needed or applied to the SGLS data. Dead time corrections were not needed because dead time did not exceed 10.5 percent.

Log Plot Notes:

Separate log plots are provided for gross gamma and dead time, naturally occurring radionuclides (^{40}K, ^{238}U, and ^{232}Th), and man-made radionuclides. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable level (MDL) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, or casing correction. These errors are discussed in the calibration report. A combination plot is also included to facilitate correlation.

Results and Interpretations:

^{137}Cs was the only man-made radionuclide that was detected in this borehole. ^{137}Cs was detected near the ground surface (2.0- through 5.5-ft log depth) at concentrations ranging from 0.2 to 4 pCi/g. ^{137}Cs was detected near the bottom of the borehole (10.5- through 12.0-ft log depth) at concentrations ranging from 0.4 to 60 pCi/g.

Apparent ^{40}K activities are less than 15 pCi/g, which probably represents the coarse-grained sediments of the Hanford H1.

The plots of the repeat logs demonstrate good repeatability of the SGLS data for both the man-made and naturally occurring radionuclides.

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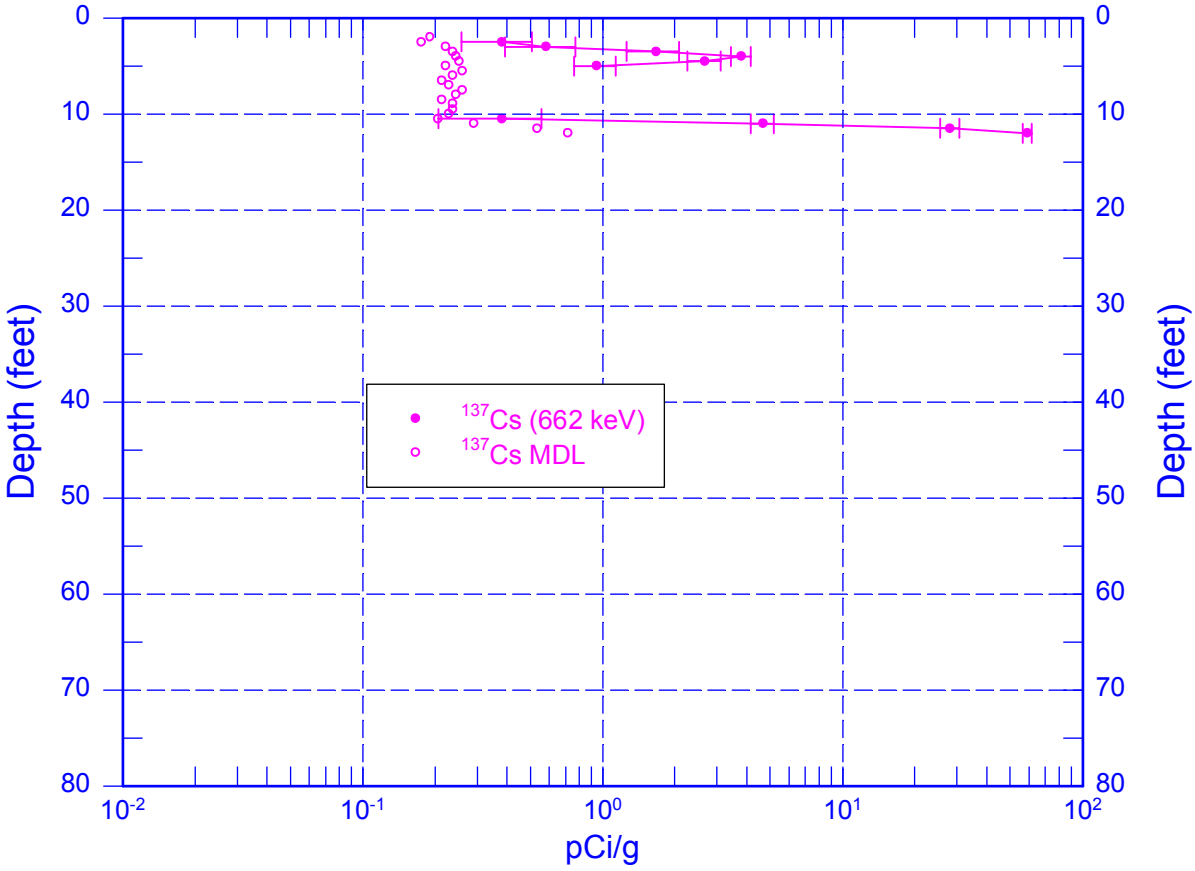
[1] GWL – groundwater level
[2] N/A – not applicable
[3] TOC – top of casing

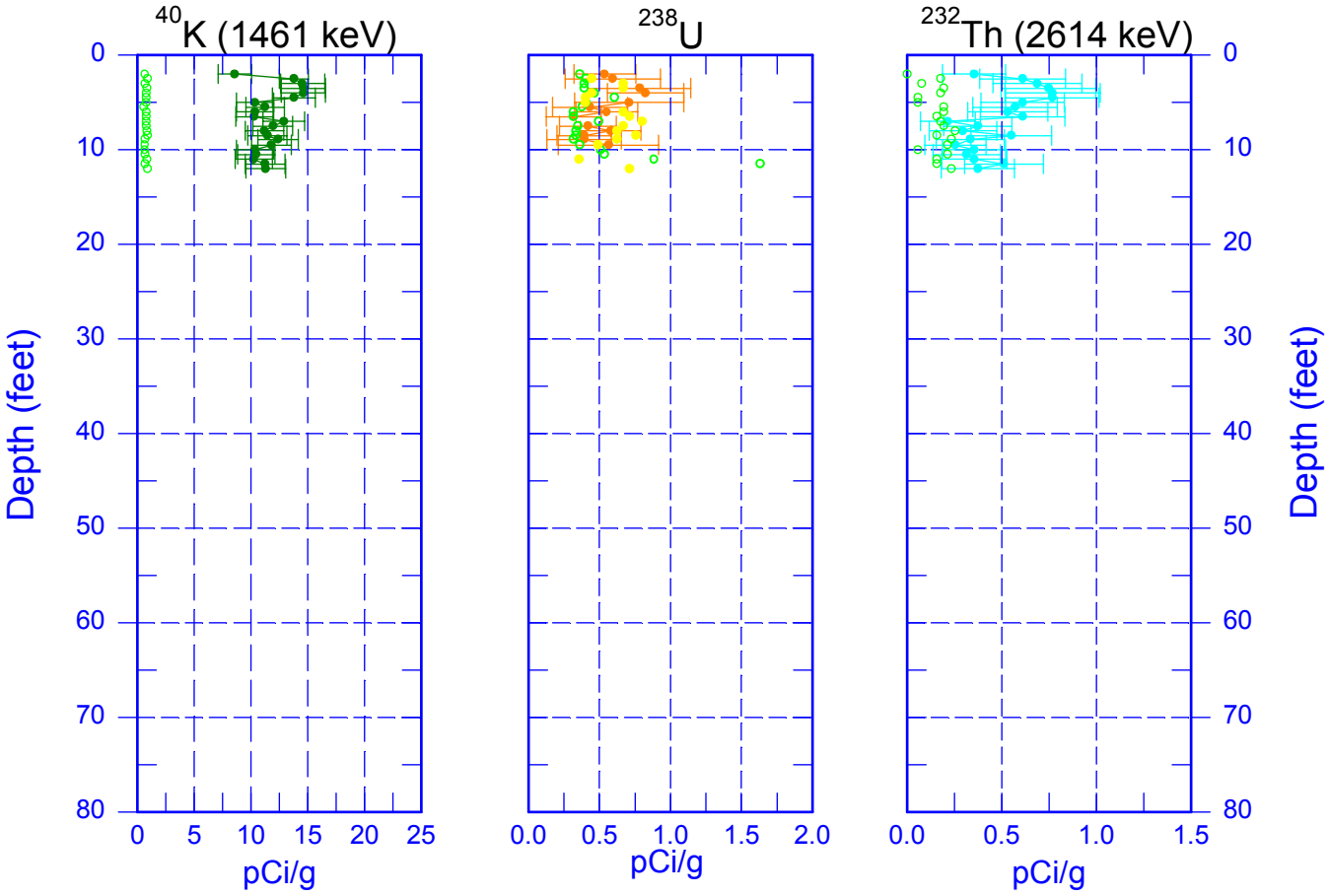
299-E28-50 (C3659)
Man-Made Radionuclides



Zero Reference = Top of Casing

Date of Last Logging Run
04/10/2002

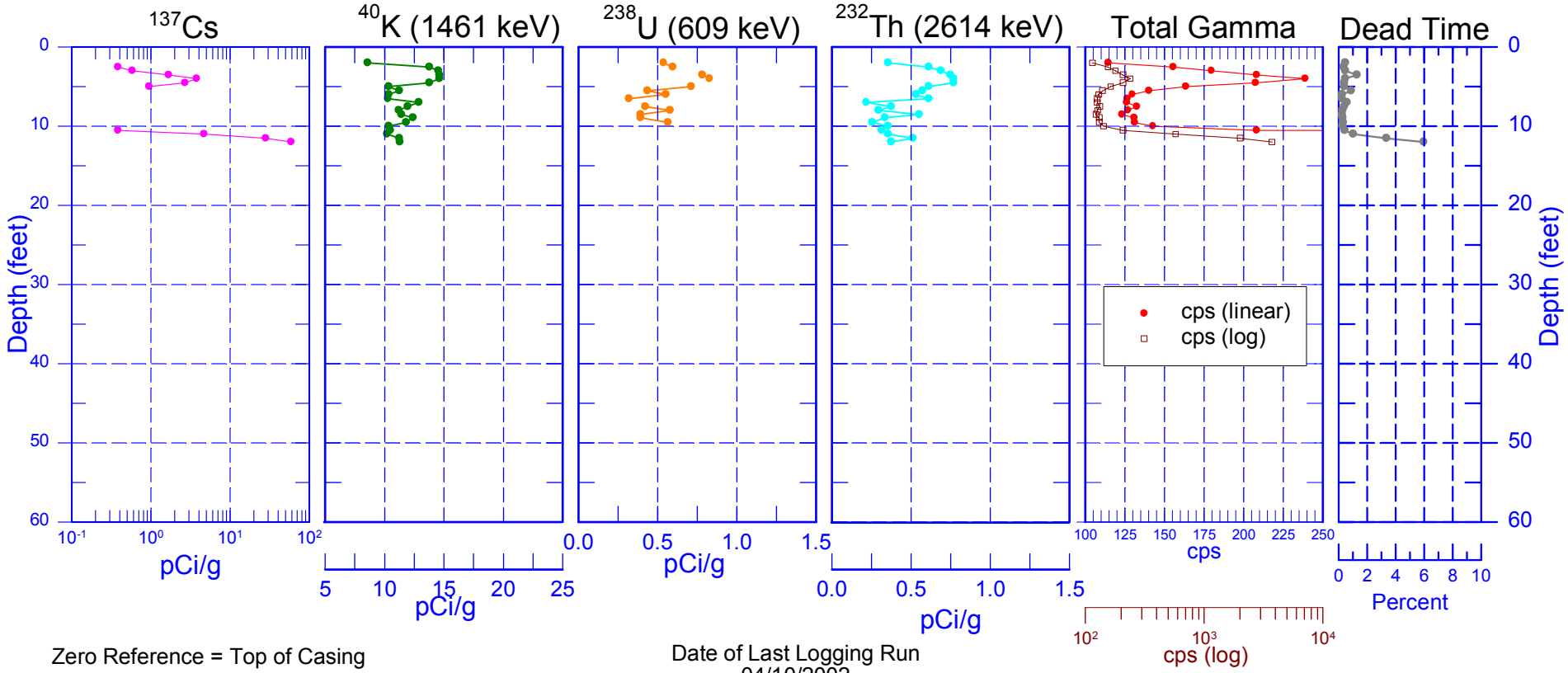
299-E28-50 (C3659)
Natural Gamma Logs



Zero Reference = Top of Casing

Date of Last Logging Run
04/10/2002

299-E28-50 (C3659) Combination Plot

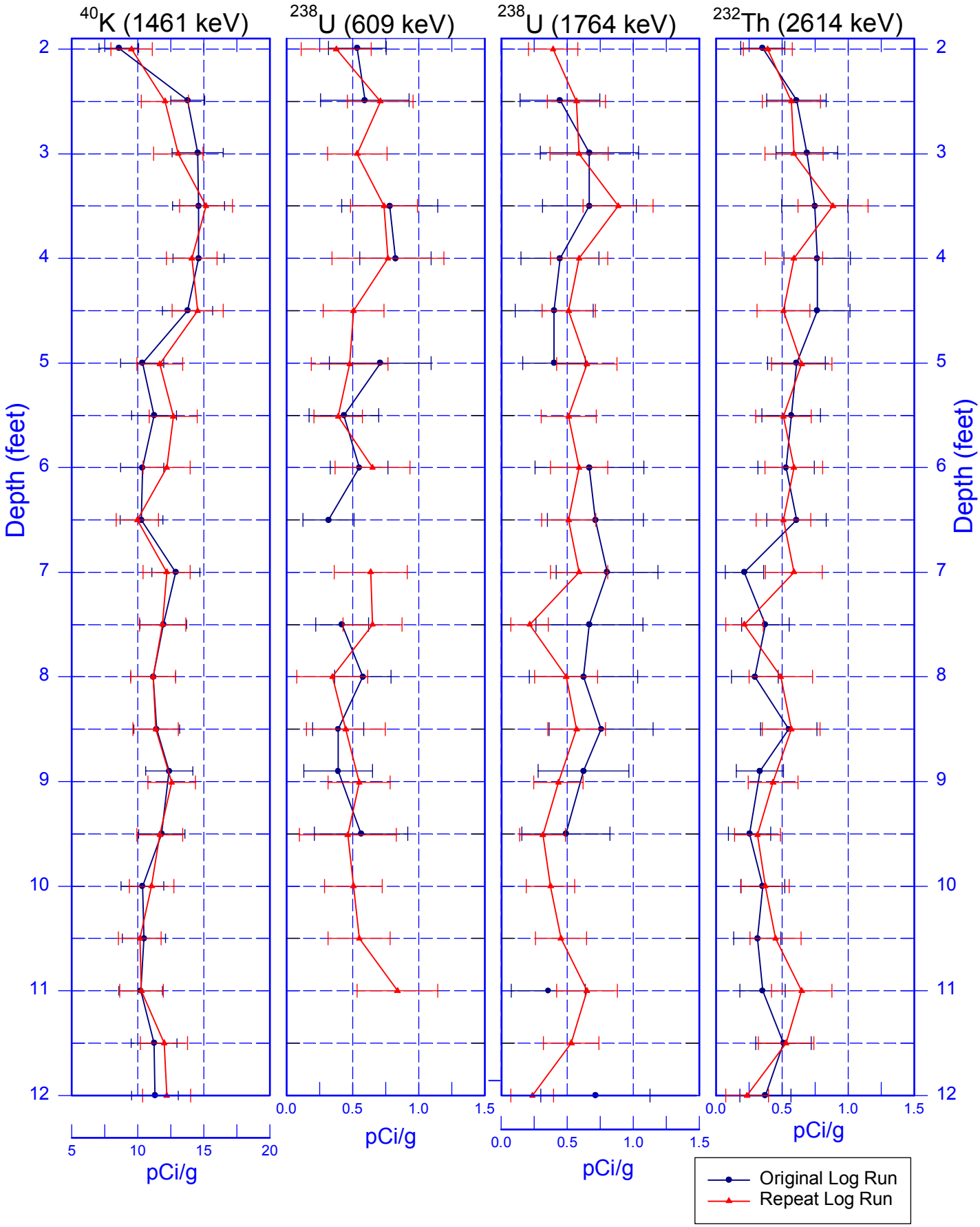


Zero Reference = Top of Casing

Date of Last Logging Run
04/10/2002

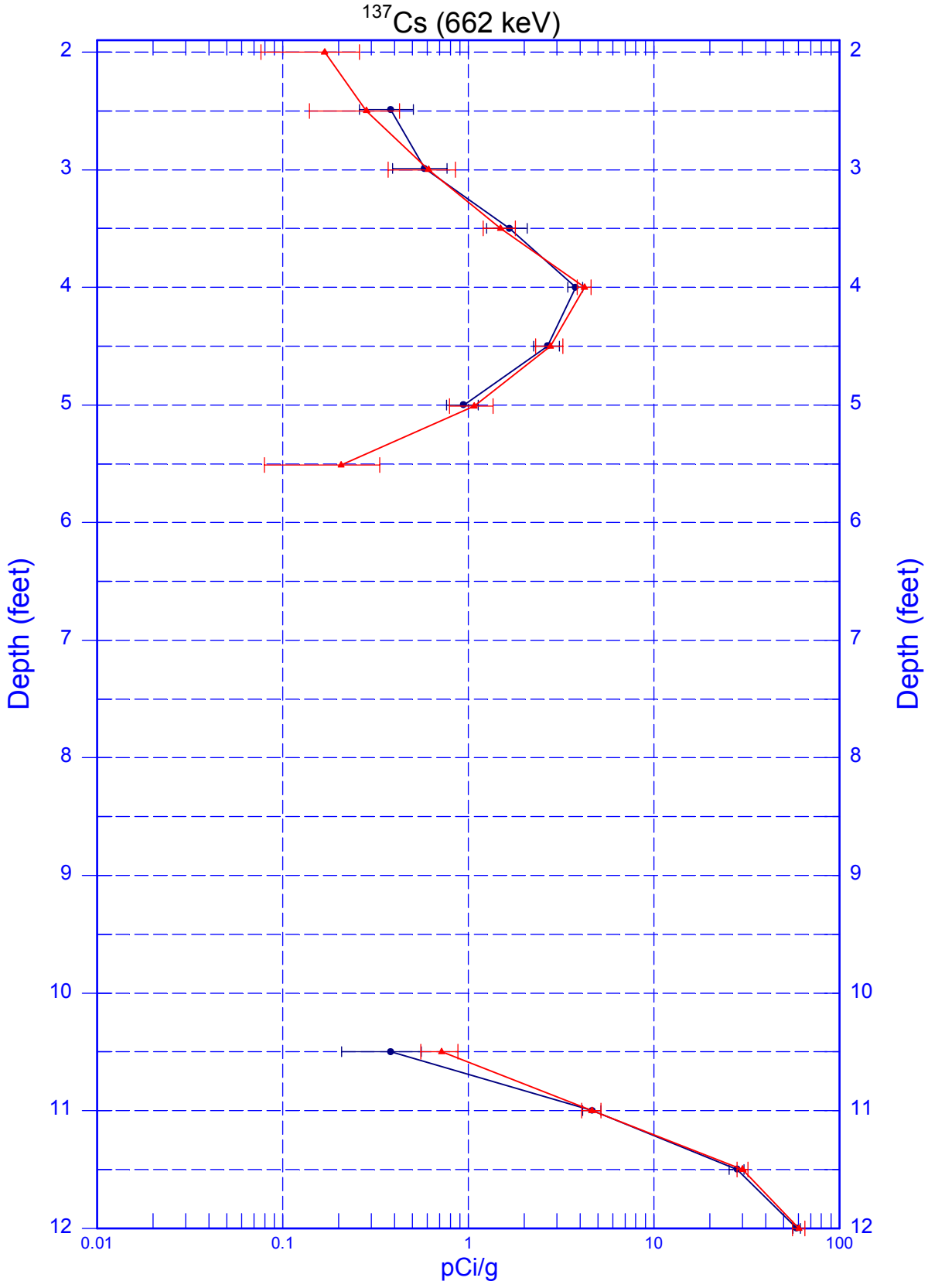
299-E28-50 (C3659)

Rerun of Natural Gamma Logs (1.9 to 12.0 ft)

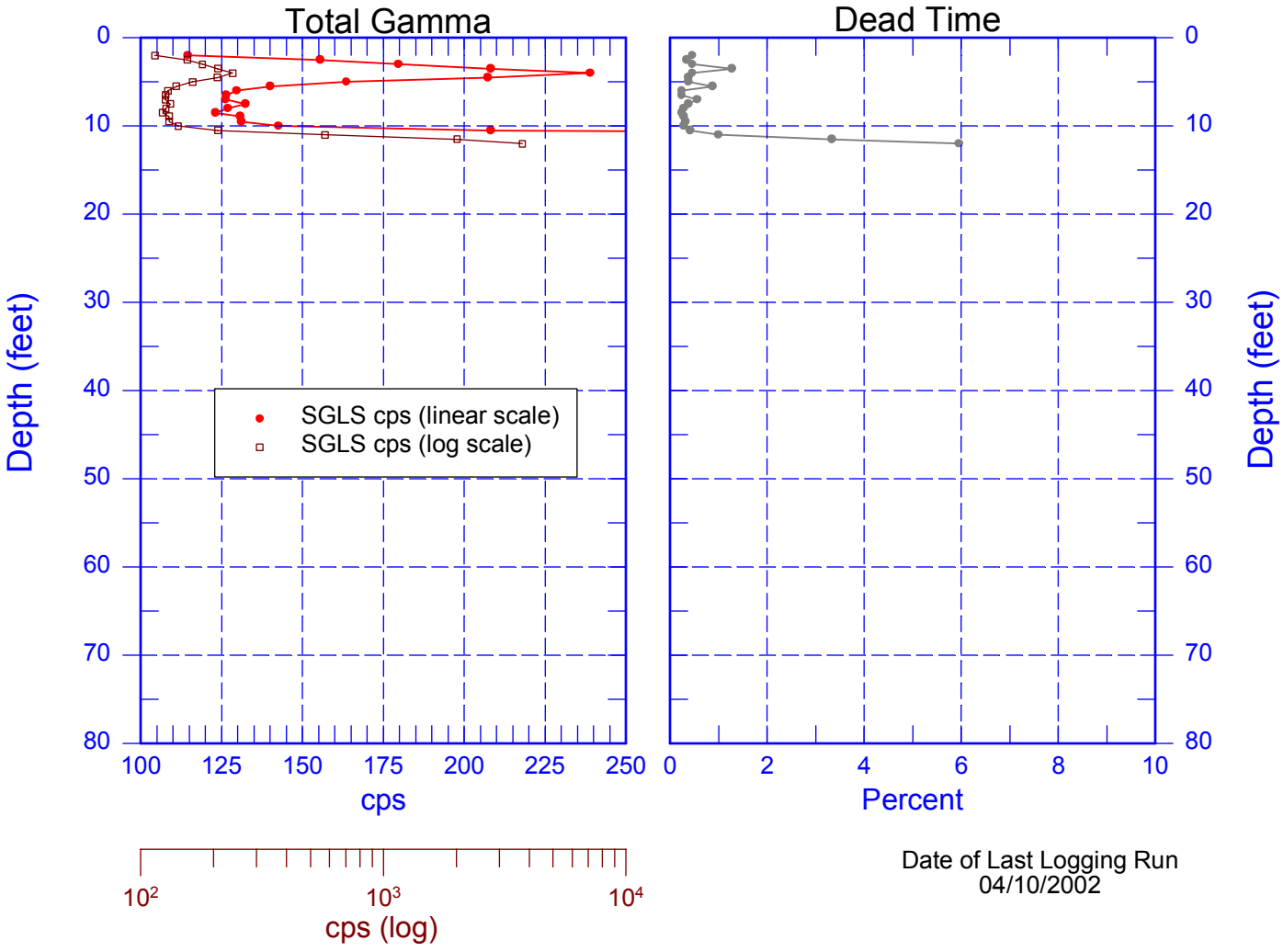


299-E28-50 (C3659)

Rerun of Man-Made Radionuclides (1.9 to 12.0 ft)



299-E28-50 (C3659)
Total Gamma & Dead Time



Date of Last Logging Run
04/10/2002

Zero Reference = Top of Casing